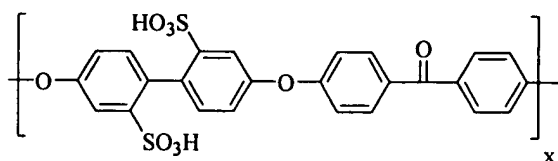


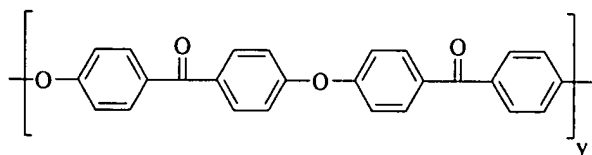
## CLAIMS

What is claimed is:

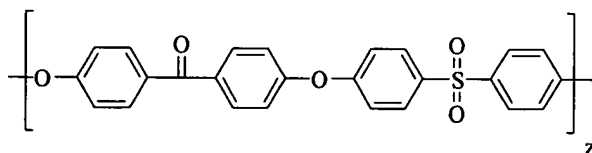
1. A membrane electrode assembly having two gas diffusion layers, two catalyst layers and an ion-exchange membrane interposed therebetween wherein the ion-exchange membrane comprises an ionomer A-B-C wherein A is



B is



C is



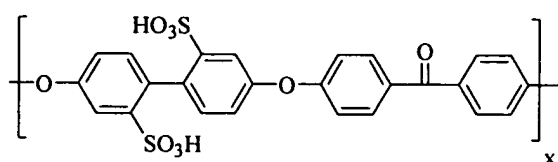
and wherein x is between 0.25 and 0.40; y is between 0.01 and 0.26; and z is between 0.40 and 0.67.

2. The membrane electrode assembly of claim 1 wherein x is between 0.29 and 0.37.
3. The membrane electrode assembly of claim 1 wherein x is between 0.31 and 0.35.
4. The membrane electrode assembly of claim 1 wherein y is between 0.08 and 0.20.

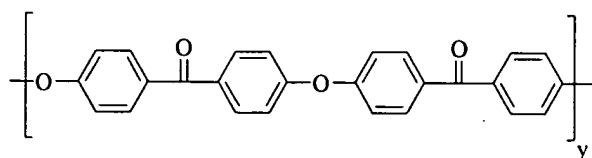
5. The membrane electrode assembly of claim 1 wherein y is between 0.11 and 0.15.
6. The membrane electrode assembly of claim 1 wherein z is between 0.45 and 0.60.
7. The membrane electrode assembly of claim 1 wherein z is between 0.51 and 0.56.
8. The membrane electrode assembly of claim 1 wherein x is between 0.31 and 0.35; y is between 0.11 and 0.15; and z is between 0.51 and 0.56.
9. The membrane electrode assembly of claim 1 wherein the ionomer A-B-C is made from a base polymer having a melt viscosity greater than  $0.4 \text{ kNsm}^{-2}$  at  $400^{\circ}\text{C}$ ,  $1000 \text{ s}^{-1}$ .
10. The membrane electrode assembly of claim 1 wherein the ionomer A-B-C is made from a base polymer having a melt viscosity greater than or equal to  $0.6 \text{ kNsm}^{-2}$  at  $400^{\circ}\text{C}$ ,  $1000 \text{ s}^{-1}$ .
11. The membrane electrode assembly of claim 1 wherein the ionomer A-B-C is made from a base polymer having a melt viscosity of about  $0.6 \text{ kNsm}^{-2}$  at  $400^{\circ}\text{C}$ ,  $1000 \text{ s}^{-1}$ .
12. The membrane electrode assembly of claim 8 wherein the ionomer A-B-C is made from a base polymer having a melt viscosity of about  $0.6 \text{ kNsm}^{-2}$  at  $400^{\circ}\text{C}$ ,  $1000 \text{ s}^{-1}$ .
13. An electrochemical fuel cell comprising the membrane electrode assembly of claim 1.

14. An electrochemical fuel cell stack comprising a plurality of fuel cells of claim 13.

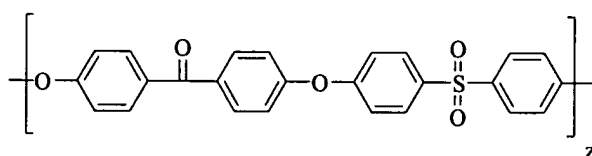
15. A method of making a membrane electrode assembly comprising:  
casting an ion-exchange membrane from an ionomer A-B-C wherein A is



B is



C is



and wherein x is between 0.25 and 0.40; y is between 0.01 and 0.26; and z is between 0.40 and 0.67, the ion-exchange membrane having an anode side and a cathode side;  
providing an anode gas diffusion layer and a cathode gas diffusion layer;  
coating an anode catalyst layer on the anode side of the ion-exchange membrane or on the anode gas diffusion layer;  
coating a cathode catalyst layer on the cathode side of the ion-exchange membrane or on the cathode gas diffusion layer; and  
bonding the anode and cathode gas diffusion layers to the ion-exchange membrane to form a membrane electrode assembly.

16. The method of claim 15 wherein x is between 0.31 and 0.35; y is between 0.11 and 0.15; and z is between 0.51 and 0.56.

17. The method of claim 16 wherein the ionomer A-B-C is made from a base polymer having a melt viscosity of about  $0.6 \text{ kNsm}^{-2}$  at  $400^{\circ}\text{C}$ ,  $1000\text{s}^{-1}$ .

18. The method of claim 15 wherein at least one of the anode and cathode catalyst layers are coated on the ion-exchange membrane.

19. The method of claim 15 wherein both the anode and cathode catalyst layers are coated on the ion-exchange membrane to form a catalyst coated membrane.

20. A membrane electrode assembly prepared by the method of claim 19.

21. A fuel cell comprising the membrane electrode assembly of claim 20.

22. A fuel cell stack comprising a plurality of fuel cells of claim 21.